THE MEASURE OF THE VALUE OF MONEY ACCORDING TO EUROPEAN ECONOMISTS.[1]

THE absolute value of the precious metals is for us an unknown quantity. Quesnay thought that wheat was more suitable than any other commodity to measure the value of money. Adam Smith too thought so, and many economists after him have held the same opinion. But wheat, which in England was worth 3.40 francs per hectoliter from 1501 to 1510, at the end of the century 1592–1602 was worth 15.33 francs. Stanley Jevons, who takes the price of wheat in 1849 as par, finds the corresponding price to be as follows:

1789,	133	1829,	124
1795,	202	1839,	144
1809,	245	1859,	120
1819,	175	1869,	119

It is therefore, strange that minds as keenly observant of facts as Quesnay and Smith should have overlooked evidence which Gregory King had indeed clearly understood and explained towards the end of the seventeenth century. Gregory King, the old herald of Lancaster, was impressed by the fluctuations of prices, especially that of wheat, which characterized the seventeenth century. Having, as Rogers says, a truly statistical mind, he inferred that the phenomenon observed by him was a general one, and drew the conclusion that the price of wheat undergoes far greater oscillations than the prices of other commodities, less necessary in the national economy. The price of wheat having at all times been an object of careful observation we have data showing its variations, which have been great even when they have been proportionally less than the fluctuations of other commodities. The many historians of

[1] Translated from the Italian manuscript by Dr. Lisi C. Cipriani.

prices from Tooke and Newmarch, from Rogers to the most recent, as Foville and D' Avenel, all agree on this point.

Then are other commodities which are of great importance to the national economy of a country — such as wool in England during the fifteenth and sixteenth centuries — exempt from oscillations in price? Quite the contrary is true. Such commodities, better than any others, reflect by their wide fluctuations in price, every disturbance in production and consumption.

Having thus ascertained the impossibility of taking a single commodity as the measure of variations in the value of money, the expedient of using instead the price of several commodities seems very simple. In fact, this plan is almost a century old. At the second session of the *Institut International de Statistique* held in 1887, Robert Giffen, who has done so much in this line, quoted a report presented in 1798 to the Royal Society of London by Sir George Shuckburgh Evelyn, entitled *Of Some Endeavors to Ascertain a Standard of Weight and Measure*. In this report, the system of what was afterwards called index-numbers, is first used. The term "index-numbers" became popular and the use of such a method became widespread after Newmarch in 1845 applied it to the price of twenty-two commodities and published the results in the *Economist*.[1] Since then the *Economist* has systematically continued the publication of such calculations, contributing greatly to the popularity of this method of economic investigation.

Jevons, Soetbeer, Palgrave, Marshall, Edgeworth and others, in addition to Newmarch and Giffen already mentioned, modified this system. The innovation of Robert Giffen, is most important, because it tended to remove the most serious charge against index-numbers, namely, that equal importance is given to all the different articles entering into the computation. English writers on commercial history and the most recent economists who have made use of and discussed index-numbers, have been unanimous in admitting that the total index-number does not

[1] *Third Report of the Royal Commission on the Depression of Trade*, Appendix, p. 328.

represent variations of prices either in a precise or in a complete way. Wheat, for instance, counts as much as indigo in the total index-number, and during the years when the price of cotton and cotton fabrics increased, the total index-number was considerably affected by this single special element. So, for instance, Palgrave takes up again the fundamental criticism of the index-number.[1] Now Giffen in obtaining the total index-number has substituted a weighted for the simple arithmetic mean, so that the price of each product considered received a coefficient proportionate to its importance. Thus the price of each product contributes to the formation of the index-number in proportion to the relative importance of this commodity in commerce.

After Giffen had tried these weighted averages Newmarch attempted with no small trouble to correct the index-numbers of the *Economist*, assigning to the various products their relative importance. But the results obtained by the new method so closely resembled those of the *Economist* that Newmarch found his labors a thankless task. Giffen, the inventor of the new system himself admits this. In a paper "On Index-Numbers" read at the first session of the *Institut International de Statistique* he says that "the committee believes and is anxious to state that it believes that weighted averages are the most trustworthy, but the similarity of the curves obtained by the methods is such that one is tempted to consider Jevons' formula sufficient, provided that the number of commodities taken is not too small."[2] Giffen expressed the same opinion in his lecture before the British Association for the advancement of science.

We scarcely understand therefore, Foville's ridiculing "the virtuosity of Jevons' mathematics" and equally unjustified is Nitti's amusement when he finds it strange that Jevons, in his index-numbers, gives the same importance to wheat, rice, butter, fruit, etc.[3] And Nitti does not stop to consider that it is exactly

[1] INGLIS PALGRAVE, "Memorandum on Currency and the Standard of Value" in the *Third Report of the Royal Commission on the Depression of Trade, 1886.*

[2] R. GIFFEN, Paper "On Index-Numbers" in the *Bulletin de l'Institut International de Statistique*, 1887, p. 129.

[3] On the contrary the first time that Jevons treated these questions in 1862 he

by choosing such a large number of commodities, that Jevons gives us the greatest guarantee of the reliability of the index-numbers. Nitti does not perceive that he himself falls into a distressing contradiction and that there is a discrepancy between the page on which he ridicules Jevons and the one soon following in which he records the opinion of Giffen and Newmarch. Here he must admit that because of the inconvenience of the other method, the employment of the simple arithmetical mean is to be preferred. The exactness of the total index-number within the limited range in which index-numbers can be considered reliable increases in proportion to the number of products considered.

Although Soetbeer was perhaps the first economist to use index-numbers for measuring the purchasing power of gold, his calculations are valuable even today because they embrace a large number of products.[1] Soetbeer takes as a basis (datum line) the prices of the period 1847 to 1850, and on this calculates the price of 114 articles.[2] Since 1886 the index-numbers of Soetbeer have been continued by Bourguin with the data of the *Jahrbuch für National-ökonomie und Statistik* of Jena.[3] It is also useful to compare the results of Soetbeer with those of Kral. Kral worked on the prices of 265 articles in Germany,[4] while the prices used by Soetbeer are Hamburg quotations.

clearly expressed the significance of index-numbers and even then shows himself far from being guilty of the confusion and the absurdities of which MM. Foville and Nitti accuse him. In 1862 Jevons wrote, apropos of the controversy concerning the fall in the value of gold, then debated by economists; "All I can pretend to prove in this inquiry is, that, subject to the vagueness just referred to, the prices of commodities have risen, or that the rise of prices of those which have risen preponderates over the fall of those which have fallen. *This is, and constitutes*, the alteration of gold asserted."

[1] R. GIFFEN, *op. cit.*, R. ZUCKERKANDL, "La mesure des transformation de la valeur de la monnaie" in the *Revue de l'economie politique*, March 1894, p. 237; and the article "Die Statistische Bestimmung des Preisniveaus" in the *Handwörterbuch der Staatswissenschaften*, th. v. p. 243.

[2] SOETBEER, *Materielen zur Erläuterung und Beurtheilung der wirtschaftlichen Edelmetaleverhältnisse und der Währungsfrage*, 2te. Ausgabe (Berlin, 1886).

[3] BOURGUIN, *La mesure de la valeur et la monnaie* (Paris, 1896.)

[4] FRANZ KRAL, *Geldwerth und Preisbewegung im Deutschen Reiche* (Berlin, 1887).

Years	Data of Soetbeer (114 articles)	Data of Kral (265 articles)
1847–1850	100	100
1851–1860	116	114
1861–1870	123	110
1871–1875	133	122
1876–1880	123	112
1881–1883	122	109
1884	114	101
1885	108.72	
1886	103.99	
1887	102.02	
1888	102.04	
1889	106.13	
1890	108.12	

The index-numbers of Pierson, combined with those of Heinz (and the authority of these two writers in such monetary questions is indisputable) give as an average the third index-numbers, which I would call after Raffalovich,[1] who has been the last one to work out the calculation.

Years	Index-Numbers	Years	Index-Numbers
1850	100	1871–1875	131.57
1851–1855	110.80	1876–1880	120.88
1856–1860	119.88	1881–1885	114.73
1861–1865	120.23	1886–1890	105.33
1866–1870	118.44	1891–1895	111.55

It can then be stated absolutely that the results obtained by Soetbeer, Kral, Pierson, Heinz, and Raffalovich agree: the purchasing power of gold varied only slightly until 1890. This results from an examination of the most exact index numbers obtained.

We know that the system of index numbers is a method of investigation whose precision can be contested. It conceals many imperfections, and even these very index numbers show considerable difference in measuring the same phenomena, though they show a certain uniformity in their general features.

[1] RAFFALOVICH, *Le marché financier* (Paris, 1897), p. 436.

This shows the imperfection of this method of investigation, although the discrepancies arise in part from the complexity of the phenomena studied.

Another method might have been used to ascertain the variations in the purchasing power of money, namely, calculations based on customhouse valuations. It is one-sided, however, because it does not consider products that are not in the international market.

A system based on household budgets has also been resorted to in order to measure the variations in the value of money. An estimate is made of all the commodities consumed by a family whose social position has been determined, and these calculations are made for different periods. The comparison of the different results obtained would measure the variations in money. But other elements, besides the variation of money, have influenced these household budgets, so that this system, in spite of the work of Le Play and all his followers to Cheysson and Toque remains too imperfect to be preferred to index numbers, whatever the deficiencies of the latter may be.[1]

[1] The variations in the kinds of commodities consumed are an essential factor. Nitti writes: Let us suppose the case of a family that for two consecutive years buys an equal quantity of goods at different prices:

First Year		Second Year	
200 A at 5	1,000	200 A at 5	1,000
400 B at 10	4,000	400 B at 20	8,000
250 C at 4	1,000	250 C at 3	750
200 D at 5	1,000	200 D at 4	800
100 E at 15	1,500	100 E at 15	1,500
30 F at 50	1,500	30 F at 10	300
1,180	10,000	1,180	12,350

This example of Nitti's shows the fallacy of the household budget method, but Nitti (*La misura delle variazioni del valore della moneta*, Turin, 1895. p. 36) copies this example from Zuckerkandl (*op. cit.*) without taking the trouble to quote him. Zuckerkandl criticizes at length this method of measuring variations in the value of money. See his *Zur Theorie des Preises*, Leipzig, 1889. Denis, therefore, justly observes, concerning a similar example given by Pierson ("Further Considerations on Index-Numbers," in the *Economic Journal*, March 1896), that it represents an extreme case, and that such an utter change in habit is very rare in real life. Cf. DENIS, "La transformation du systême monetaire" in the *Annales de l'Institut de*

Therefore the data of Soetbeer, Kral, Pierson, Heinz, and Raffalovich are the most reliable ones in regard to the variations in the prices of products during recent years.

Although the above-mentioned data can be variously interpreted, the bimetallists say: The value of gold has increased. They say this in order to conclude that gold has caused the fall in the price of agricultural products. The bi-metallist campaign in Europe is based on this conviction. And it is, indeed, a curious fact that in looking at silver the agrarians are so fascinated by the idyl of seeing other coins again that they forget the hydra of agrarian competition in America, in Argentina, in Russia, in India, convinced that it will be paralyzed by the remonetization of silver. And meanwhile they do not perceive that Uruguay, confined to a small peninsula whose population scarcely numbers one million, that this forgotten little republic, the only one that has known how to put an end to the political troubles which lay waste the other republics — that Uruguay has exports which surpass those of Argentina and Chili taken together. By an unpropitious coincidence Uruguay is the only South American republic that has a good gold currency and a favorable exchange. The exportation of wheat increases there as in no other part of America; from three million kilograms in the first six months of 1897 it increased to 61 millions in the first six months of 1898.[1]

Sciences Sociales, Bruxelles, 1891, p. 71). It is only in case of great intervals that the consumption of a people would show great change. Thus in the case proposed by D'Avenel, who would like to know the value of all values, of all cultivated lands, of all the commodities annually consumed in the actual territory of France; first, during the year 1520 -- the year in which the influx of American gold into Europe began — and then for 1895. It would undoubtedly show at once that at two periods so widely separated, the constituent parts of this wealth would differ greatly, and, consequently, that each part of this wealth represents a very different amount of silver. The magnitude of the rise or fall in the purchasing power of silver in either case would in great part depend on the stock of the metal already on hand.

[1] In the first six months of 1897 there were exported:

5,800,000 kilograms of wheat flour, 413,000 kilograms of maize.

In the first six months of 1898:

16,000,000 kilograms of wheat flour, 4,000,000 kilograms of maize.

At the same time the development of industries diminishes importations from 36,823,863 pesos in 1889 to 19,671,640 pesos in 1897. Uruguay is a country economically new. As in all new countries the population is rather sparse. It is very natural that commerce should develop, and especially that the exportation of wheat should increase. Land is cheap. In the interior it is absolutely at a minimum price. Extensive cultivation, especially that of wheat, therefore, is eminently suitable. This natural condition of Uruguay is favored by a good monetary circulation that does not injure its foreign commerce. One can say as much of two other countries, also very young economically, and also having perfect gold currency, the Cape and Australia. It is the wool exported from these gold-using countries that has contributed most to the fall in the price of European wool and to the crisis which this branch of commerce is undergoing.[1] When the exchange between two countries is always oscillating, a new element of chance is added to the uncertainty inherent in any trade. Manufacturers and merchants, fearful lest fluctuations in exchange will cause a loss, often abandon operations which they would otherwise have attempted. The foreign commerce of a country with depreciated currency is paralyzed by the agio on its money. Thus J. Tyrrell Baylee has shown well enough the real obstacle to Anglo-Indian trade which has been caused by the sudden fall in the value of the rupee.[2] The variation in the value of money and the uncertainty of exchange has unfortunately an influence as harmful to the exports as to the imports of a country. If Argentina, if India, if Russia, if the various other wheat exporting countries which have depreciated currency, had bettered their money, it is logical, it is undeniable that their foreign commerce would be freed from a power that paralyzes it, and would immediately be profitably developed.

The commercial crisis has paralyzed Argentina. Immigrants

[1] BAMBERGER, *Le metal argent* (Paris, 1894) p. 267.

[2] J. TYRRELL BAYLEE, "English Industry and the Gold Standard," in the *Westminster Review*, August, 1896.

no longer find work there. For some years Argentina has shown the phenomenon, strange for a new country, of having emigration exceed immigration. The heavy exchange has upset all its national economy. On the other hand, if Argentina had not suffered this terrible and persistent crisis, immigration would have continued on as large a scale as before, and new tracts of land would have been cultivated. The production of wheat would have been more plentiful than it has been in recent years, and greater quantities of it would have been thrown on the European markets. This would have produced a new decline in the price of wheat. That which has happened before, will happen for some time yet, until old Europe, so thickly populated and with human labor so ill employed, shall see many of her sons cross the ocean, or shall find for them some more useful and remunerative occupation. The agrarian question is a serious and distressing sociological problem; there is a serious want of equilibrium between the overcrowded countries of Europe and some parts of America and Asia, where population is relatively sparse, and this is all to the disadvantage of Europe. The European agrarian question is one of the many manifestations of this lack of social equilibrium.

The opinion held by European agrarians that a question so complex and so intricate, so vast and so difficult to solve, can immediately and easily be reduced to the mere phenomena of an appreciation of gold, is narrow and trivial.

Gold is said to have increased in value because of the demonetization of silver. The discomfort which weakened Europe, and of which the extreme political parties take advantage, offering their own social systems as a remedy, is attributed by the agrarians to the demonetization of silver and the consequent appreciation of gold. To the agrarian, European civilization should take a backward step—it should go back to silver.

The socialists, like the agrarians, show the same absence of common sense, and minds equally fallacious and empty in their solution of the modern social and economic crisis. Agrarians

and bimetallists quote the calculations of Sauerbeck to prove the increase in the value of gold. I have seen these calculations quoted by Helm, by A. Hondard, by Thery[1] and by many others among the most authoritative European bimetallist economists as an indisputable proof of the increased value of gold, and the consequent crisis produced in agriculture.

The index-numbers of August Sauerbeck are calculated on the prices of the total sales of these forty-five commodities:

English wheat, American wheat, flour, barley, oats, maize, potatoes, rice, prime beef, middling beef, prime mutton, middling mutton, pork, bacon, butter, West India beet sugar, Java sugar, coffee (two kinds), tea (two kinds), pig iron, iron bars, copper, tin, lead, London coals, export coals, upland cotton, Indian cotton, flax, hemp, jute, merino wool, English wool, silk, hides, leather, tallow, palm oil, olive oil, linseed oil and linseed, petroleum, soda crystals, nitrate of soda, indigo, timber.

The average prices from 1867 to 1877 inclusive, are taken as 100. Now this period is too troubled by fluctuations in prices to be fit to be taken as a basis for calculation. We have during this period grave economic disturbances produced by the war of 1870, the crisis of 1873, etc. Jevons had insisted on the necessity of making allowance for the influence of the crisis, but Sauerbeck pays no attention to this. On the other hand, though no serious objection can be made to the choice of commodities whose prices Sauerbeck considers because some are finished commodities ready for consumption, some raw materials, and some partially manufactured articles, yet they are wholly insufficient to reflect with any accuracy the total movement of prices in the economic markets of the world.[2] And this is so even though they represent an important part of English commerce, and in spite of their variety and the care taken to choose differ-

[1] ELIJAH HELM, *The Joint Standard* (London, 1894), p. 80. A. HONDARD, "Les mines d'or de l'Afrique du Sud," in the *Bulletin de la société d'économie politique* (Paris, 1896), p. 9. E. THERY, "Le bimetallisme international," in the *Économiste européen*, 1896, p. 171.

[2] W. STANLEY JEVONS, *Investigations in Currency and Finance* (London, 1882), with introduction by Foxwell.

ent qualities of the same commodity. Sauerbeck omits the rate of wages. He gives no reason for this omission, but it is easily guessed. Had wages been included, it would have upset completely the result which Sauerbeck obtained, thanks to this omission.[1] Only such imperfections in the compilation of the index-numbers of Sauerbeck can explain the difference in result that they show when compared with those of Soetbeer, of Kral, and others.[2] These are the data given by Sauerbeck:

Year	Average value in relation to gold		Average value in relation to 45 commodities	
	Of the 45 commodities	Of silver 60.84 = 100	Of gold	Of silver
1867–77	100	100	100	100
1870	96	99.6	104	103.7
1871	100	99.7	100	99.7
1872	109	99.2	91.7	91
1873	111	99.4	90	88.7
1874	102	95.8	98	93.9
1875	96	93.3	104	97.2
1876	95	86.7	105.2	91.3
1877	94	90.2	106.3	96
1878	87	86.4	115	99.3
1879	83	84.2	120.5	104.4
1880	88	85.9	113.6	97.6
1881	85	85	117.6	100
1882	84	84.9	119.2	101.2
1883	82	83.1	122	101.3
1884	76	83.3	131.5	101.6
1885	72	79.9	139	111
1886	69	74.6	145	108
1887	68	73.3	147	107.7
1888	70	70.4	142.8	100.6
1889	72	70.2	138.8	98.9
1890	72	74.1	138.8	108.9
1891	72	74.1	138.8	102.9
1892	68	65.4	147	96
1893	68	58.3	147	85.7

The first column gives the actual average prices of the 45 products for each year since 1870 relative to the average price

[1] It is true that the accusation of omitting wages cannot be limited to Sauerbeck. Pareto made use of this omission to make a general attack on such a method of investigation. See PARETO, *Cours d'économie politique* (Lausanne, 1896), p. 280.

[2] Other important criticisms which deny any practical importance to the index numbers of Sauerbeck are made by PIERSON, "Index Numbers and Appreciation of of Gold," in the *Economic Journal*, September 1895.

for the period 1867–1877. The second column represents in the same way the annual average price of silver in London. The third and fourth are obtained from the first and second and indicate, according to Sauerbeck and all the bimetallist economists who have accepted his calculations respectively, the values of gold and silver, measured in the terms of the 45 commodities.

It is not necessary again to insist upon the errors of fact found in these index-numbers of Sauerbeck, but it is exactly on account of these errors that they can serve as an argument for the bimetallist thesis.

Still more false, however, is the economic conclusions drawn, that there has been an increase in the value of gold. It is as though they set two persons near them: A and B; A is taller than B. They measure A with B and naturally the former is taller than the latter. Then they measure B with A, and B must surely be shorter than A. This comes from the preliminary hypothesis itself. Now this is the discovery made with the index-numbers of Sauerbeck. In Sauerbeck's calculations the increase in the value of gold comes from the very hypothesis assumed; it comes from the premises of these calculations, but these prove nothing.

D'Avenel calculates that assuming the purchasing power of gold at the present time to be one, the centuries preceding ours would show the following scale:[1]

13th C., First quarter	= 4½	16th C., First quarter	= 5
Second "	= 4	Second "	= 4
Third "	= 4	Third "	= 3
Fourth "	= 4	Fourth "	= 2½
14th C., First quarter	= 3½	17th C., First quarter	= 3
Second "	= 3½	Second "	= 2½
Third "	= 3	Third "	= 2
Fourth "	= 4	Fourth "	= 2⅓
15th C., First quarter	= 4½	18th C., First quarter	= 2¾
Second "	= 4½	Second "	= 3
Third "	= 6	Third "	= 2⅓
Fourth "	= 6	Fourth "	= 2

[1] D'AVENEL, *Histoire économique de la propriété*, tome i. pp. 27–32.

Now in spite of certain oscillations, the purchasing power of gold shows a constant tendency to decrease. But who is ignorant of the multiplied causes that have contributed to them. In the long period from the seventeenth to the eighteenth century, gold and silver had been constantly growing in quantity. The ever-increasing abundance of money tends to make prices rise, never to make them fall. But Sauerbeck and the bimetallist assert that for the last quarter of the present century the prices of commodities have diminished because the value of gold had increased. They do not perceive that in their calculations this increased value is purely the consequence of the diminished price of the commodity.[1] Following Sauerbeck's own calculations, Guyot, Pierson, Raffalovich, and others have reached an opposite conclusion, namely, that it is the fall in prices which causes the increased value of gold. And if we stop for a moment to consider the phenomenon we shall be immediately convinced that these authors are right.

If gold really had increased in value, it would mean that the value of silver and that of all the commodities had remained unchanged. This paradox, which is sustained by Foxwell,[2] is the extreme conclusion reached by the arguments of the bimetallist.

This modern controversy, in which none assert an appreciation of gold denied by the others, offers a striking resemblance to a debate which took place between economists toward the middle of the century. Then Michel Chevalier, in his well-known

[1] In regard to the measure of value, Gide writes: If it is admitted that work is a result of value, or rather of demand, nothing is more scientific than to measure a cause by its effects. Gravity is measured by the pendulum more accurately than by the balance. The balance only gives a comparison of weights — just as exchange only gives a comparison of values — while the pendulum measures the force of gravity itself. It teaches, for instance, what the balance would never teach, that the force of gravity decreases with an increase of elevation. — *Principes d'économie politique* (Paris, 5th ed., 1896). p. 82. Gide forgets all the simplicity and the constancy of physical causes and all the variable complexity of social causes. For while in physical phenomena there is almost always a perfect correspondence between the same causes and the same effect, this rarely happens with social phenomena.

[2] *Revue d'économie politique*, June 1896. On Foxwell, see also his introduction to JEVONS'S *Investigations*, etc., already cited.

work, *On the Probable Fall of the Value of Gold*, predicted with profound conviction a great decrease in the value of gold; and Richard Cobden, who to his wonderful intelligence united the deepest scorn for any kind of adulation, published in 1859 an English edition of Chevalier's work. On the other hand Newmarch in his continuation of Tooke's *History of Prices*, published in 1857, and McCulloch in the *Encyclopædia Britannica*, in 1858, maintained a thesis absolutely opposed to that of Chevalier. Later, in 1863, Jevons, in one of his first essays, attempted to strengthen the thesis of the French economist. This controversy found repeated echoes in the Royal Statistical Society and many business men and many economists took part in it.

The literal but incorrect translation of the English phrase, "appreciation of gold," has also contributed to produce errors in the modern controversy. It has been taken as synonymous with an "increased value," and this connection has almost become a popular superstition.

It is true that J. S. Mill made one of his usual hasty assertions when it pleased him to declare the theory of value complete, and when he charged with logomachy the economists who continued the discussion. Far from being beyond discussion, as Mill asserted in 1848, the theory of value is today still as uncertain as ever. But Hermann Heinrich Gossen, in 1854, clearly stated the equation of exchange in his *Entwickelung der Gesetze des menschlichen Verkehrs und der daraus fliessenden Regeln für menschliches Handeln.* Gossen is the first author and this the first volume of the later so-called Austrian school, which took as the basis of the theory of value the *Werth des letzten Atoms* as Gossen called it, the "final degree of utility" of Jevons. He has announced his equation in these terms: "The two commodities after the exchange must be divided between the two parties in such a way that the last atom of each commodity received shall have the same value for both parties."[1]

It is the comparative intensity of wants that determines the

[1] See the splendid demonstration and elucidation given by WALRAS, *Éléments d'économie politique pure*, Lausanne, 1896, pp. 182 *et seq.*

value of commodities and the consequent exchanges. The value rises or falls according to the comparative intensity of want.[1]

Such a relation expressed in money is called price. The greater or less abundance of money, cannot, therefore, influence the value of the various commodities and of services. Such value depends on the comparative intensity of human wants, to which the products and services conform. It is independent of money and of money price, but it is undoubted that the quantity of money influences the price of commodities. The classic case of the fall of price which took place in the sixteenth century on account of the invasion of the European market of gold and silver is always quoted here. The service or the commodity that before 1492 cost one could not be had after that for less than six monetary units.[2] The influence of the first American production of silver ceases according to Thorold Rogers, to show itself only toward the middle of the seventeenth century.[3]

But even this phenomenon is exaggerated. Haupt calculates that the two precious metals, in the period extending from the latter part of the fifteenth century to 1520, were reduced to only one millard and the purchasing power of money was sixfold what it is at present, hence the conclusion that the influence exercised by the quantity of the precious metals on the price of commodities is considerable. On the contrary, it is a fact that the relative value of gold and silver, ascertained to be 10.75 during the period 1495–1520 varied a little in the years following. Riese, who estimates the ratio at 10.31 for 1518 makes it too small: Copernicus erred on the other side when he places the ratio at 12. for the year 1526.[4] The data prepared by Soetbeer, Shaw, Wirth, and others are more important and reliable.[5]

[1] Those not understanding the mathematical method can consult F. VON WIESER, *Ueber den Ursprung und die Hauptgesetze des wirthschaftlichen Werthes* (Wien, 1884); BOEHM-BAWERK, *Grundzüge der Theorie des wirtschaftlichen Güterwerthes* (Wien, 1886).

[2] G. DE MOLINARI, *Notions fundamentales d'économie politique* (Paris 1886), p. 165; G. BUCCARDO, *Socialismo sistimatico e socialiste incoscienti* (Roma, 1896), p. 57.

[3] THOROLD ROGERS, *History of Agriculture and Prices in England*, vol. i. p. 170.

[4] V. PARETO, *Cours d'économie politique*, Lausanne, 1895, p. 286.

[5] A. SOETBEER, *Edelmetall-Produktion und Werthverhältniss zwischen Gold und*

These statisticians estimate the ratio between the values of gold and silver as follows:

Year	Ratio	Country
1540	11.82	France
1540	10.62	The Netherlands
1551	11.38	Germany
1552	11.1	England

It is well known that from 1545 to 1560 there was an abundant production of silver in the mines of Potosi. However, this considerable quantity of silver altered very little the relative value of the two metals. Even in the last years of the sixteenth century and until 1620 it remained at 12.25.[1] In 1640–1 the ratio varied in the different markets as follows:[2]

Germany	12
Milan	12
Flanders and the Netherlands	12.5
England	12.33
France	13.5

In spite of the difference in the amounts produced the relative value of gold and silver changed very little. This phenomenon is very important. It serves to prove that the variations in the value of gold and silver have been far less than is commonly believed. On the other hand, the prices of commodities were affected in some countries by immigration, in others by exportation to Spain, Portugal, and the Netherlands, in exchange for the gold and silver which these latter countries received from America. The effect of this and of the other causes which together produced a rise in prices in the sixteenth and in the first part of the seventeenth centuries, has wrongly been attributed solely to the new production of gold and silver. When the cost of production diminished, the prices of the sixteenth and seventeenth centuries appeared all the greater, and the cause

Silber seit der Entdeckung Amerikas bis zur Gegenwart (Gotha, 1879); MAX WIRTH, *Das Geld* (Liepzig, 1884).

[1] SOETBEER, *Edelmetall-Produktion, etc.*

[2] LEBLANC, *Traité historique des monnaies de France* (Paris, 1690), p. 49.

of that high-water mark was always attributed to the American production of the precious metals.

Another fact is to be noticed. There was a beneficial effort on the part of the Netherlands to counteract the excessive influence of the silver production of America. The center of monetary exchanges had passed from Italy to the Netherlands. Antwerp had taken the place of Venice or Florence. Antwerp in the sixteenth century, as London today, always fulfilled a most important function: it regulated the flow of the precious metals into Europe by exporting their excess to the East. Antwerp was a safety valve for the monetary market of the sixteenth century. The Netherlands, together with Portugal, had founded a vast colonial empire which extended over all the coasts of Africa and India. Venice would have been quite unable to hold her own against the influx of the precious metals which the sixteenth century saw in Europe.[1]

Today an excessive circulation of paper money increases the stock lying in banks and out of circulation. Price and Walker, two excellent political economists who accept the quantity theory, are forced to admit that the modern development of credit obscures and renders less intimate the relation between precious metals and prices.[2] Thus, after 1520, the effect of the increased American production of precious metals on the prices of European commodities, is much reduced by the exportation of these precious metals to India, to the African colonies, whenever their production tends to exercise too disturbing an effect on the European economic equilibrium.

Montesquieu mentions what Garcilasso affirms in his history of the Spanish civil wars in the Indies. He tells how after the conquest of the Indies, incomes were decreased by half. This had to be so; a great quantity of silver was suddenly brought into Europe; soon few persons were without money and the price of everything rose.[3]

[1] "On European Mediæval Gold Coins," in the *Numismatic Chronicle*, third series, vol. ii. p. 212 *et seq.* Even Rogers, D'Avenel, Shaw, and others mention this fact.

[2] *American Economic Association, Economic Studies*, vol. i. no. i. 1896.

[3] MONTESQUIEU, *De l'esprit des lois* (Paris, ed. Garnier), p. 355.

Among the revolutions included in the French Revolution of 1789 is that in the prices of commodities, produced by the *assignats*. As in Garcilasso's account of the effect produced by an inflated currency, we must make allowance for rhetoric and exaggeration, so in the account of the effect of inflation in France, we must also make some allowance. The depreciation was not entirely due to the excessive quantity issued; part of it must be attributed to distrust and to the instability of the issuing government. But even after reducing to its due proportion the influence which the quantity of money exerts on the level of prices, and granting that these two cases are indeed exceptional and almost unique, this influence nevertheless remains very great and apparent even to those who in other more delicate and less pathological cases deny the relation of causality between the quantity of money and prices. Those two examples are like the proof by fire for the atheist reluctant to accept anything on faith. The fact that the paper circulation of the bank of England has altered prices did not escape the keen and powerful mind of Ricardo, the banker, who, though he limited himself to the discussion of problems of theoretical economics brought to it the marvelous practical spirit that had gained him no small fortune. This fact escapes however the observation of Cobbett and of his followers, who did not weary in attacking Ricardo's view on this subject.[1]

Others, and they are more in number than those who deny it, have exaggerated the influence of the quantity of circulation on prices. Alfred de Foville[2] found, not long ago, that Bernardo Davanzati was the author of this theory, which is just as false as the one advanced by Cobbett. Davanzati, as early as 1585, affirmed that by an agreement made among men, all the gold put into circulation, adding to it, if desired, silver and copper, represents exactly what is necessary for men to buy the different things that they may need in life. Montesquieu accepts

[1] J. H. HOLLANDER, *Letters of Richard Cobden to John Ramsay McCulloch*, New York, 1896, p. 119.

[2] ALFRED DE FOVILLE, "La théorie quantitative et les prix," in the *Économiste français*, April 5, 1896, p. 451.

Davanzati's idea, and makes affirmations quite as explicit as they are absurd. Hume takes less risk; Smith and J. B. Say exaggerate even less the pretended equivalence of the quantity of available commodities and the money in circulation. Stuart Mill, who goes a step backward and in the hurry of writing sometimes, not infrequently, takes little heed of what he writes, asserts in an axiomatic way, as the most elementary principle of the theory of circulation, that the rise of prices is the inevitable consequence of the increase of money. When money diminishes prices fall.[1] He neglects thus the influence of an enormous number of factors that interfere and always perturb these economic phenomena. Pasche[2] has demonstrated this, and has succeeded fairly well in correcting the famous "Quantity Theory," which was accepted by Mill and so many others.[3]

In vain is the attempt made to establish a clearly determined relation between the production of precious metals and the price of commodities Soetbeer has gathered statistics on the total production of gold and silver from 1701 to 1840. Daniel Zolla, also a believer in the great influence of the demonetization of silver on the fall of prices of agrarian products, has compared the various periods of abundant or scant production of the precious metals with the course of prices of commodities.

First Period	Total Production (kilograms) gold	silver
1701–1720	256,000	7,111,000
1721–1740	381,000	8,622,000

period of very low and of falling prices.

Second Period		
1741–1760	492,000	10,881,000

very feeble rise, period of transition.

[1] If there be any satisfaction in quoting errors with which a theory presents itself for the first time, it is useless to quote these errors when they vulgarly persist after science is in full possession of the truth which they oppose. So this error can no longer be discussed when it is reaffirmed by a member of the *Societé d'Economie Politique*, of Paris, namely by Limousin as late as 1895.

[2] PASCHE, *Studien über die Natur des Geldentwertung*, Jena, 1898.

[3] MILL, *Principles of Political Economy*, vol. ii. book ii. chap. viii.

Third Period	Total Production (kilograms) gold	silver
1761–1780	492,000	13,053,000
1781–1800	355,000	17,578,000
very rapid rise, high prices.		
Fourth Period		
1801–1820	291,000	14,346,000
less rapid rise, high prices.		
Fifth Period		
1821–1840	344,000	10,567,000
rapid fall, low prices.		
Sixth Period		
1841–1850	547,000	7,803,000
1851–1855	996,000	4,429,000
1856–1860	1,008,000	4,524,000
1861–1865	925,000	4,505,000
1866–1870	974,000	6,694,000
1871–1875	889,000	9,845,000
period of rise in prices.		
Seventh Period		
1876–1880	861,000	12,249,000
1881–1885	745,000	14,306,400
1886–1890	822,000	17,364,000

Since 1890 the production of the precious metals has greatly increased while the prices of commodities have suffered a great stagnation. However, even Zolla remarks elsewhere that, if stagnation in prices, or this prolonged decline which seems to characterize only the present years, has a strange resemblance, almost a counterpart, in the similar phenomenon in the eighteenth century from the close of the reign of Louis XIV until the end of 1760,[1] yet the monetary conditions of those times, and the production of the precious metals differed greatly from the present. A limited importance must be attached to the first three periods, which extend from 1701–1800. The need of money was then very restricted, nor was there then the growing development of commerce and industries, most modern industrial usages were lacking, the absorption of the precious metals by the East was not so marked as it is today. The economic con-

[1] D. ZOLLA, *Études d'économie rurale* (Paris, 1896), p. 4.

ditions of the last century are so different from those of the present one that comparisons cannot safely be made. However, Zolla contents himself with pointing out the rise in price, during the period extending from 1760 to the French Revolution as a consequence of the increased production of gold. He forgets the grave economic crisis of this period in France, the distressing poverty of the country; and it is this dearth that determines the rise in prices. The relations of causality established by Zolla in that empirical way have no demonstrated importance. It is enough to read the famous *cahiers* to hear the cry of anguish over the misery that then afflicted France. Charles Gomel has splendidly illustrated the economic causes of the French Revolution; yet after having scrutinized in a wonderful way its most remote causes, he never thinks of mentioning the deficiency of coined precious metals.[1]

Nor do we find any more reliable the investigations of another bimetallist, E. d'Artois, who pretends to demonstrate empirically how the increased production of wheat has in no way influenced its fall in price. In 1760 every French inhabitant consumed only 180 liters of wheat, in 1870 he consumed 200, in 1897 he consumed 338. The same phenomenon is found everywhere. But if the quantity of wheat consumed by every inhabitant has increased, D'Artois claims that the price cannot have fallen on account of the increased production; if the supply of wheat has increased, so has the demand. But the free traders do not deny this. They claim, however, that such a beneficial effect is produced by the decline in price. D'Artois wants to eliminate one phenomenon, the lowering of the price of wheat by increased production, putting forth as the cause of the increased production what is really only its effect —the increase of consumption.

However, even such superficial investigations as those of Zolla and of D'Artois contradict the very thing they would like to demonstrate. In the fourth period the production of the precious metals diminished, but the prices remained high; they even

[1] C. GOMEL, *Les causes financières de la revolution francaise* (Paris, 1892).

increased somewhat. In the following period, in spite of the real increase in the production of gold, the prices fell in a crisis. Then comes the economic development of the second half of the century, which is due to various and multifarious factors. But for this period Zolla simply affirms: "The rise in prices is due to the facts that we have pointed out — to the gold of California."[1] From a student of questions of agrarian economy, like Zolla, these assertions astonish one; they are due to mere preconceptions. The years 1872 and 1873 were marked by great industrial activity. Germany then increased in a wonderful manner her production for the home and foreign trade. The production of coal, machinery, cast iron, steel, etc., received the strongest stimulus. Naval industry received a most potent impulse, and the charges for transportation considerably decreased. This encouraged the importation of wheat from America, India, Russia, etc.

Meanwhile the period of gold monometallism begins in continental Europe. Germany, by the law of December 4, 1871, had begun its monetary reform completed by the law of July 9, 1873. (1) Germany demonetized the 1800 millions of silver that she had in 1871. That contributed to produce a depreciation in the value of silver.[2] France profited by this in the payment of her war indemnity to Germany. Leon Say in his admirable work — perhaps his best scientific production — says thus: "Of 239 million francs paid to Germany in silver 92 have been coined in five-franc pieces from German silver." (2) In 1871 Brussels alone had coined 25.5 millions in five-franc pieces. The amount of silver coinage for 1873 was 112 millions at Brussels and 250 millions at Paris! (3) The amount of coined metal is therefore more in 1873 than in 1871. If the scarcity of money after 1873 has been the cause of an economic crisis that has produced the cheapening of agrarian and industrial products, such a crisis should have begun in 1871. If the money

[1] D. ZOLLA, *Études d'économie rurale* (Paris, 1896), p. 255.

[2] According to the data of Ottomar Haupt it appears to be at least five lire per kilogram. *Arbitrages et parités* (Paris, 1895), p. 10.

in circulation in 1871 has permitted the commercial development of the two successive years, all the more should the money in circulation in 1873 have permitted the continuation of that first commercial development. Instead there has been the crisis. Helm, a bimetallist, calls it a reaction against the economic development of 1871–1873. But what does this vague expression "reaction" mean and what produced it? To give it, as Helm does, as an explanation of economic phenomena, whose causes are easily intelligible, is a very convenient system, but it is stupid.[1]

In 1878 the United States began to coin again the old dollar of 412.5 grains of silver. It mattered little that free coinage remained forbidden to the public. After this, until 1890, no new legislative acts affected the demonetization of silver.[2]

The production of gold oscillated, it is true, but its yearly average, which in 1881–1885 was limited to 149,000 kilograms, rose continually, and in 1889 reached 178,000 kilograms. Compare these figures with those of the annual production of gold from 1831 to 1840, which was only 20,289 kilograms,[3] a small fraction of the production of 1889. However, even in the years succeeding 1890 the demonetizations of silver are very limited, whatever may have been the effect upon the money market of the action of Roumania in regard to her 25 million francs of silver, or that of France, who in 1891 introduced gold monometallism into Tunis. On the other hand, the silver reserve of the European banks remains unaltered:

	Millions of francs
December 31, 1888,	2496
December 1, 1893,	2459
January 2, 1898,	2459

[1] If there has been a crisis, it has been brought about by agiotage and by the abuse of credit; but for the bimetallists all the complexity of economic phenomena disappears and the demonetization of silver remains as the cause of all evil.

[2] Haupt gives a pretty accurate list of all the legislative measures that have contributed to the depreciation of silver. In this period none appears. (*Arbitrages et parités.*)

[3] SOETBEER, *Literaturnachweis über Geld und Münzwesen* (Berlin, 1892).

On the contrary, the production of gold has increased from 587 millions in 1890[1] to 1030 millions in 1897.[2] George J. Goschen, certainly the most authoritative and the keenest of modern economists, said in a communication to the London Institute of Bankers that Germany, the United States, and Italy, taken together, have consumed at least 5000 million francs. Goschen estimates the production of gold for these years at 500 million francs. He accepted the calculations of Laveleye, and hence thought that only half of this production was employed in monetary coinage. Goschen concluded thus: "Fully twenty years of gold production are necessary to satisfy the extraordinary demand of the United States, of Germany, and of Italy."[3] Facts have contradicted Goschen's predictions. But, independently of the error concealed in these pessimistic predictions on the future of gold, the distinguished economist has made a mistake by overlooking certain other very essential elements in his calculation.

The production of gold having doubled, the twenty years of production which Goschen estimated as necessary to compensate for the gold extraordinarily absorbed by the three above mentioned countries are reduced to ten. Perhaps the twenty years might be reduced to even less than ten since Goschen then calculated that one-half the production of gold was employed in the industries and arts, but with the increased production, a larger proportion has been used for coinage.

In fact, towards the middle of this century, Tooke and Newmarch estimated the gold employed in the industries and the arts at 60 per cent. Messedaglia accepted their estimate, but, on account of the simple fact that gold production has increased,

[1] RAFFALOVICH, *Le marché financier*, p. 381.

[2] LEROY-BEAULIEU, *L'inanité des campagnes bimetallistes.*

[3] Now these figures, although accepted by many others who are regarded as competent to speak on such questions, are among the highest, if not the very highest, given. Tooke and Newmarch, on the contrary, give a minimum figure of two million pounds sterling, or 50 million francs (*History of Prices*, vol. i). Seyd reached only 140 million francs as the average figure from 1848 to 1875 (*Report of the Committee of the House of Commons on Depreciation of Silver*, London, 1886). See also the study of STEPHEN BOURNE in the *Journal of the Royal Statistical Society*, June 1879.

he reduced to 50 per cent. the proportion of the gold thus employed. In this he followed the advice of Soetbeer. The same should be done today, and a very limited number of years will suffice to supply these 200 million francs absorbed by the coinage of the United States, Germany, and Italy. Haupt calculates the gold coined during 1897 to amount to 300 million dollars;[1] that is, to more than one milliard of francs. The five milliards required by the United States, Germany, and Italy, present, then, nothing very exceptional if this ordinary coinage of gold is considered. But even apart from his very pessimistic prediction, which was not merely a personal opinion but one held also by Gibbs,[2] Giffen, Soetbeer, Haupt, Hansard, Patterson, and first of all by Suess, Goschen is wrong because he does not take into account the effects of all the institutions that are a perfect substitute for money. Even then, John B. Martin, a man who had lived too much in the London business world not to know minutely its most delicate operations, blamed Goschen for this great omission, which rendered his conclusions altogether unreliable. Since then the variety and number of such institutions has increased in a continually more marvelous manner.

In the last fifty years English circulation has considerably diminished, although the population has almost doubled in the meantime, and international commerce has increased fivefold.[3] France has a greater quantity of coined precious metal than

[1] *Journal of Finance*, London, 1898.

[2] Henry H. Gibbs, then the president of the International Monetary Association, in 1883, came to this conclusion: "One cause alone has been persistent, and that is the appreciation of gold. That commodity is produced less and is used more, and, like other commodities in like case, it is consequently dearer." He predicted that the production of gold would go on diminishing while the demand for industrial and monetary uses would increase.

[3] It suffices to say that England has only two milliards of gold circulation, while France has over five. BAMBERGER, *Le metal argent à la fin du XIX^e siècle*, Paris, 1896: But France has only the clearing house of Paris, with its exchanges, in 1895, of 6,147,527,000 francs, while in the same year in Italy the exchanges reached 15,379,192,000 lire. And though it is true that the transactions of the Bank of France in 1895 amounted to more than 141.5 milliards, and only 2.05 per cent. of this appeared in specie, 23.87 per cent. in bank notes, and 74.08 in checks (see *Le Matin*, August 3, 1896), the Bank of France had to keep a reserve of 3322 millions in coin.

England, and this, undoubtedly, arises from the fact that the clearing-house system is more widespread in England. Thus, although in most civilized countries the institution is still in its infancy, Vandervelde estimates that the daily exchanges in the clearing houses amount to at least 1500 million francs.[1] This figure is perhaps considerably exaggerated, and with more reliable calculations and data that refer to 1895, we make it at most 1400 million francs.[2]

The system of *social comptabilisme* of Solvay has failed, as did Robert Owen's labor exchange; both proposing to eliminate money from economic contract. We can, however, say that the system of the governor of the Bank of France, a man far more practical than Owen or Solvay, has succeeded. Since 1846 he has tried to bring about a system that should have this result. Business men should settle their social contract by means of reciprocal claims, without the actual intervention of money. These obligations being gathered together at a given place when they fall due would almost completely balance each other, so that debts thus contracted would be mutually extinguished. Today, when this happy idea has been almost universally adopted, the use of money has in fact greatly diminished. It will diminish still more.

[1] EMILE VANDERVELDE, "Les chambres de compensation," in the *Annales de l'institut des Sciences sociales*, 1896, p. 39.

[2] HEINRICH RAUCHBERG, "Der Clearing- und Giro-Verkehr in Oesterreich-Ungarn und im Auslande," in the *Statistische Monatschrift*, 1896. In 1885, the total clearing, in thousands of crowns, were divided thus among the different countries:

America,	252,245,928
London,	182,361,380
Manchester,	4,076,233
Newcastle,	1,015,215
Liverpool,	2,702,293
Birmingham,	984,689
Germany,	25,023,013
Paris,	2,925,117
Italy,	7,322,494
Vienna,	702,594

But Italy had these institutions even in the Middle Ages. They were, however, of a peculiar type, of which the one still existing at Leghorn is an example.

Suess had predicted that the discoveries of gold mines would progress as rapidly as geographical discoveries. Goschen, Gibbs, and the bimetallists generally were more pessimistic about the future of gold. They all said: The production of gold would continue to diminish, as it had already diminished, while the demand for industrial and monetary uses would increase, as it had already increased, with the growth of population. Instead of this being so the very opposite has taken place. The increased production of gold is not due merely to chance. To a greater extent than was formerly supposed, it follows the law of demand, and we may predict that for many years to come it will continue to increase, or at least maintain itself on the high level of recent years. This is the view accepted by almost all European economists.

Stanley Jevons,[1] as early as 1868 began to work on the statistics of the precious metals. He had a special technical knowledge of this matter. He had been employed for many years in the Mint at Sidney. After him, in 1882, Martin, an expert banker of London, undertook similar researches, and obtained results which did not differ greatly from those obtained by Jevons. Not very reliable, and rather empirical, are the calculations of the director of the United States Mint. "Thus, for instance, countries whose monetary systems are so divergent as the United Kingdom and Portugal, as the United States of America and India, as Mexico and Russia, are described as under the same monetary system—gold, gold and silver, and silver respectively, while the Greek drachma is taken as of the same value as the French franc."[2]

Soetbeer made only a partial calculation of the coined precious metals, contenting himself with England, France, Italy, Belgium, Switzerland, Germany, the United States, China, and India. According to Soetbeer the circulation of these countries alone would amount to more than 28 milliards. In spite of the

[1] STANLEY JEVONS, "On the Metallic Currency in the United Kingdom, and International Coinage," in the *Journal of the Royal Statistical Society*, 1868.

[2] *Journal of the Royal Statistical Society*, vol. lviii, p. 559.

great ability of the author these calculations, because incomplete, must be considered unreliable.

The work of Lesley C. Probyn is passably accurate and complete. For 1894 he quotes these figures:[1]

WORLD'S STOCK OF COIN.

	State and bank holdings (in thousands of pounds)	In circulation (in thousands of pounds)
Gold	446,915	374,498
Silver, nickel and copper	233,372	475,212

In a few years more of gold production it will be possible to substitute gold for the silver. But much of this silver remains in the banks just as though it did not exist. The figures of the always stable silver bank reserves are given here. The gold reserve of the banks suffers a continual flux and reflux from the gold money in circulation; according to the needs of the market it increases the gold in circulation or is increased by it. These are the figures of this reserve in millions of francs:

December 31, 1888,	4,436
" 31, 1891,	5,642
" 31, 1892,	6,207
" 31, 1893,	6,116
" 31, 1894,	6,952
" 31, 1895,	7,596

But there is a tendency to increase. If, as the bimetallists claim, the gold required for circulation were insufficient, the contrary phenomenon should present itself. And not only that, but banks of issue should, if there were need of a circulating medium, reach the limit of their circulation. Instead of this, the experience of the Bank of England is quite different. The relation of metallic reserves to circulation in this bank was as follows:[2]

[1] PROBYN, "Gold and Silver, and the Money of the World," in the *Journal of the Royal Statistical Society*, 1895, p. 561.

[2] PIERSON, *op. cit.* and *Économiste européen*, 1896, p. 354.

March 21, 1895,	152	per cent.
" 5, 1896,	188	" "
" 12, 1896,	198	" "
" 19, 1896,	194	" "

That is to say, the Bank of England has no call to emit even one-half of the issue allowed by law, which is an amount equal to its metallic reserves plus the uncovered issue based on government security.

A similar condition is found in all the banks authorized to issue notes in Europe, as is shown by the following table exhibiting the relations between the circulation and the metal reserve:[1]

December 31, 1891,	58	per cent.
" 31, 1892,	58	" "
" 31, 1893,	56	" "
" 31, 1894,	62	" "
" 31, 1895,	63	" "
March 5, 1896,	68	" "
" 19, 1896,	68	" "

In all books and all treatises on political economy it is said that experience points to metal reserve of one-third credit circulation. Instead of this, a metal reserve of two-thirds has actually been maintained by the principal European banks. This average would be still higher if it were not diminished by that of the countries with ruined finances. The metal reserve of the National Bank of Greece is only 2 per cent. of its circulation, that of the Imperial Bank of Germany was, March 15, 1895, 112 per cent. of its circulation. If these banks cannot emit all the bank notes to which they are entitled, and suffer on this account an economic loss, it means that there is no demand for them. In fact money has never been so plentiful as it is now in the principal European markets. Discount has become very low in all money centers. The following are the exchanges of the London Clearing House,[2] that essentially international market,

[1] *Économiste européen*, Paris, 1896.

[2] RAFFALOVICH, *Le marché financier*, 1894–5, p. 40. Note, however, the fact, that while the great monetary plethora began in London in 1890, the commercial activity of this city is still on the increase. The London and Southwestern Railway had, in

the center of modern commerce as Antioch was that of other times.

	First half year	Second half year	Total
1885,	2,787	2,724	5,511
1886,	2,863	3,038	5,901
1887,	3,075	3,001	6,077
1888,	3,461	3,480	6,942
1889,	3,843	3,755	7,618
1890,	3,907	3,894	7,801
1891,	3,562	3,285	6,847
1892,	3,302	3,179	6,481
1893,	3,370	3,108	6,478
1894,	3,247	3,090	6,337
1895,	3,573	4,010	7,592

The payments through the clearing house have diminished. In London the transactions of the clearing house are considered an infallible indication of the activity or the stagnation of business. If the economic crisis were produced by the deficiency of coin, as three English economists of European reputation, Shield Nicholson,[1] Robert Giffen,[2] and Professor Foxwell[3] have claimed, then the clearings should have increased, not diminished. The coined gold idle at the banks should have diminished, but this did not happen. Credit circulation increased but slightly, the low discount did not secure a renewal of business, either at London or in other commercial centers.

Money is therefore abundant. This is indisputable. The quoted facts are frequent and numerous, and thoroughly confirm each other without a single contradiction. How can the abundance of the circulating medium be doubted?

The course of prices (index-number) of the forty commodities in this last period was, according to the calculations of Sauerbeck, as follows:

the six months, July–December 1895, *gross* receipts amounting to £1,982,651, with an increase of £94,164 over the corresponding period in 1894. The Great Eastern Railway, in the last months of 1895, had an income of £2,501,297; in 1894 it had been £2,343,462. See *Économiste français*, February 1, 1896, p. 135.

[1] J. SHIELD NICHOLSON, *A Treatise on Money* (London, 1888), p. 273.

[2] R. GIFFEN, *Essays in Finance* (London, 1886), p. 102.

[3] *The Contemporary Review*, December 1892.

December,	1893,	-	67.0	May,	1895,	-	62.4
June,	1894,	-	63.1	June,	1895,	-	62.8
August,	1894,	-	63.0	July,	1895,	-	63.3
September,	1894,	-	62.7	August,	1895,	-	63.5
October,	1894,	-	61.7	September,	1895,	-	63.3
November,	1894,	-	60.8	October,	1895,	-	62.3
December,	1894,	-	60.1	November,	1895,	-	62.3
January,	1895,	-	60.	December,	1895,	-	62.3
February,	1895,	-	60.80	January,	1896,	-	61.4
March,	1895,	-	61.7	February,	1896,	-	61.4
April,	1895,	-	62.5				

In spite of slight oscillations, easily explained, the decline in the prices of commodities as shown by these index-numbers is continuous, even in the last period. It is more marked in commodities that are an object of international commerce, as is shown by the data given by S. Bourne, who treats of commodities imported into and exported from the United Kingdom.[1]

1890	75.9	1893	70.9
1891	75.7	1894	66.5
1892	72.3	1895	64.1

Now the difference which appears between the fall in prices of the forty-five commodities considered by Sauerbeck and those of Bourne, shows that special causes must concur in their action on each of the two groups under consideration, so as to effect the different course of decline in their several prices.

The conviction that the variations in prices are influenced by causes peculiar to them is greatly strengthened by observing these data of Soetbeer. These are the prices of the various commodities that have contributed to form the general index-numbers, but are here separated into groups of products :[2]

[1] They are obtained by the method indicated, first by R. GIFFEN, in his *Report on Recent Changes in the Prices of Exports and Imports*, London, 1888.

[2] I. Agriculture articles, 20 articles.
II. Products of cattle and fish, 22 articles.
III. South European produce, 7 articles.
IV. Colonial articles, 19 articles.
V. Produce of mining, 14 articles.
VI. Textiles, 7 articles.
VII. Sundries, 11 articles.
VIII. British industrial articles of export, 14 articles.

	I	II	III	IV	V	VI	VII	VIII	I-VIII
1861–1870	131	132	117	118	98	130	125	129	123
1876–1880	138	146	138	126	94	102	96	111	123
1881–1883	139	154	142	121	84	96	96	104	122
1884	123	150	120	117	78	97	84	103	114
1885–1891	104	131	125	116	77	99	81	95	105

The prices of each group show a law of change peculiar to themselves. Even Sauerbeck has to admit this, and he gives separate quotations for each of the groups, which, for the year 1895 are as follows:

	Number of quotations	Total of prices	Average price
I. Vegetable products, grain, etc. (wheat, flour, barley, oats, maize, potatoes and rice)	8	433	54
II. Animal products (beef, mutton, pork, lard and butter)	7	544	78
III. Colonial products (sugar, coffee and tea)	4	247	62
Groups I, II and III	19	1224	64
IV. Minerals (iron, cast-iron, lead, tin, coals)	7	435	62
V. Textiles (cotton, linen, tow, jute, wool and silk)	8	416	52
VI. Various products (wood, leather, hides, tallow, petroleum, oil, soda, nitrate, indigo)	11	719	65
Groups IV–VI	26	1570	60
Total	45	2794	62

However, the error concealed in the average general price obtained by Sauerbeck is not peculiar to his index-numbers alone. The *Economist* also gives average index-numbers which are:

1845–1850	2.200	1884	2.221
1879	2.202	1888	2.230

Now, while such index-numbers vary little, these perturbations which took place in the prices of some commodities[1] are striking:

[1] The term of comparison chosen is the average of prices in 1845–1850, and it is

	1879	1884	1888
Coffee,	143	106	166
Sugar,	55	54	49
Tea,	111	92	64
Tobacco,	156	200	244
Corn,	75	73	58
Tin,	77	104	173

But the index-numbers of Sauerbeck are based on hardly more than a third of the commodities taken by Soetbeer. The commodities considered by the *Economist* number only twenty-two, that is less than a third of those taken by Sauerbeck. Yet, even the index-numbers of Sauerbeck show the fallacy of this system. Even in them the course of prices follows its own peculiar law of variation. The average price of these index-numbers refers to 1847–1850 and is supposed to equal 100. These are then the corresponding prices for each group of commodities in 1888 in the same market, Hamburg:

Agricultural products,	99
Animal products,	130
Southern products,	118
Colonial products (except cotton),	116
Mineral products,	76
Textile products,	81
Various products,	74
Exports from England (wool, silk, etc.),	94
Total index-number,	102

The system of index-numbers, used for lack of any preferable one in measuring variations in the value of money, causes misleading and absolutely mistaken conclusions. The total index-number is the resultant of many different facts and phenomena and is based on heterogeneous if not on unreliable data. It attributes to one single factor phenomena that are different by their very nature. The twenty-two commodities from which the economist's index-number is compiled show an aggregate average price for the years 1845–1850 of 2200. This remains

made equal to 100. See concerning this, SCHOENHOF, *History of Money and Prices* (New York, 1896).

almost unchanged in 1891, having risen only to 2224. In the half century none of the twenty-two commodities preserve the same price, and each price varies independently in accordance with the demand and supply of the respective commodities. The very simplicity of the system of index-numbers used for the purpose of determining a very complex phenomenon should make us indifferent or skeptical as to the value of results showing so insignificant a variation. With only the total index-numbers before us, it is impossible to assign the proper share of influence to each one of the numerous technical processes which have determined the fall in price of various commodities, or to determine the action which improvements in production, fashion, crisis, and many other varying factors have exercised on the course of prices. Finding it impossible to give the real significance of the total index-number, all its variations are attributed to oscillation in the value of money. But it is apparent that the variation in the purchasing power of money is a consequence, an effect, of obscure, and complex causes. The total index-number gives us, then, the effect measured in money, of all the technical, industrial processes, and of all other causes which have determined the changes in price of the enumerated commodities.[1] If the index-number shows an increase in the purchasing power of money, it is an effect, a consequence of these factors, and the decline in the prices of commodities is due to those varied and complex causes.

But the protectionists do not understand the spirit of the index-numbers. They mistake the effect for the cause. They attribute to the increased value of gold the phenomenon which is instead caused by the diminished price of the commodities.

Let us take the prices of the commodities which Sauerbeck has made use of to calculate his index-numbers. The group of

[1] We easily understand [says Jevons] that during the Crimean War, the price of wool should go up. During the present blockade of the southern ports of the United States, cotton has increased two or three times its natural value. Money in these cases, measures the economic effect which the Crimean or the United States war has on wool or on cotton, but this economic phenomenon is absolutely independent of money and its measure. This is the case with index-numbers.

products which has diminished in price more than any other, and which consequently determines more than any other group a low general index-number, is the group of textile products. But we all know that the decline in the price of textile products has nothing to do with the demonetization of silver, but that it is due to the revival of this industry in the United States, after the Civil War. The depression in the prices of cotton begins long before 1873. The wool drops considerably in price because of the competition in this product from Australia, the Cape, etc. Even potatoes have enormously diminished in price. The German Empire alone gives about one-third of the potato crop in the world.

If we take the prices of potatoes in the markets of Magdeburg, of Stettin, of Breslau, of Berlin, for the years 1893, 1894, 1895, and compare them with those of the years 1879, 1880, 1881, we find that during this interval the price of potatoes has fallen from 30 to 40 per cent., or even more. The grades that in the earlier three years obtained a price of 30 or 32 marks per ton are now sold with difficulty at 21 or 22 marks.[1] How distressing the condition of agriculture in Germany would be if all prices had decreased in a like ratio. But the potato crisis is simply due to an excess of production, not compensated by a corresponding increase in the quantity consumed. Exactly the contrary has taken place in the case of coffee. The production of coffee has increased but consumption has increased still more. The price of coffee has increased about one-third; in 1879–1881 the price of Rio coffee was 147 francs per 100 kilograms; in 1893–1895 the same quality was sold at 200 francs. The price of tea on the contrary fell about 20 per cent. from 1879–1881 to 1893–1895.

All those who follow the theory of value of Smith, revived by Marx and accepted by the protectionists, should recognize that the value of gold has diminished wages, the most important of all prices, everywhere, even when the economic crisis has reduced the profits of the manufacturer. And Cohnstaedt has

[1] *Grosshandel–Preise wichtiger Waaren an deutschen Plätzen im Jahre 1895 und in den 17 Jahren 1879 bis 1895.* Bearbeitet im Kaiserlichen statistischen Amt.

ascertained, for 1895, in Germany, a rise in the prices of wheat, iron, petroleum, rice, cotton, copper, and tin.[1] But in all these cases there are special causes that justify and explain such a rise in their price, and it would be foolish to attribute it to a decrease in the value of gold.

It has been shown that an abundance of the circulating money has coincided in point of time with an economic crisis, in which there has been a decline in the price of most commodities. But any such decline is a special case to be separately explained. In some cases the fall is strongly accentuated, in other cases it is less marked and in still other cases there is an advance in price. So much has been shown and we are led to the following conclusions.

a) The crisis of 1895 is due to causes independent of the circulating medium.

b) The system of index-numbers is altogether inadequate as a basis of economic deductions where it is used to measure variations in prices and in the value of money. It gives rise to gross economic errors.

c) If prices have diminished, it is due to causes peculiar to the production and the consumption of special commodities. The price of other commodities has increased. All this has taken place independently of the value of gold.

d) It cannot be said that the value of gold has increased. If today, when the prices of many commodities have diminished, the same weight obtains more goods in exchange, the fall in price is due to special causes peculiar to cach commodity.

It is true, therefore, that the campaign for the re-establishment of bimetallism in Europe, fought with such obstinacy by the agrarians, has had against it all the leading economists of the Old Continent.

G. M. FIAMINGO.

ROME, 1898.

[1] L. COHNSTAEDT, *Goldzuwachs und Waarenpreise* (Frankfurt, 1895).